REMARKS

With this amendment, claims 24-27, 29-34, and 36-37 have been amended to more clearly indicate that they are directed to an apparatus. In addition, claim 10 has been amended to clearly indicate that each one of the intervals of a pulse-train is unequal in duration to *each other* interval between pulses of the pulse-train. No new matter has been introduced by these amendments. Claims 10-12, 14-27, 29-34, 36, and 37 remain in the instant application.

In the January 15, 2003 Office Action, the Examiner:

- Rejected claims 24-27, 29-34 and 36-37 under 35 U.S.C. § 112, second paragraph, as being indefinite for allegedly failing to clearly identify whether they are directed to a method or an apparatus;
- Rejected claims 10-12 and 14-23 under 35 U.S.C. § 101 as being directed to non-statutory subject matter;
- Rejected claims 10, 12, 14, 16, 24, 26, 29, 31, 33, and 36 under 35 U.S.C. § 102(e) as being anticipated by United States Patent 6,493,378 B1 to Zhodzishsky *et al.* (hereinafter "Zhodzishsky");
- Rejected claims 18, 19, 21, 30, and 37 under 35 U.S.C. § 103(a) as being unpatentable over Zhodzishsky; and
- Objected to claims 25, 27, 32, and 34 as being dependent upon allegedly unpatentable claims.

THE REJECTION UNDER 35 U.S.C. § 112 SHOULD BE WITHDRAWN

The Examiner rejected claims 24-27, 29-34 and 36-37 under 35 U.S.C. § 112, second paragraph, as being indefinite for allegedly failing to clearly identify whether they are directed to a method or an apparatus. Applicants have amended claims 24-27, 29-34 and 36-37 so that they more clearly recite an apparatus. In particular, claims 24 and 31 were amended to recite "[a] memory of a spread-spectrum-multiple access communication system." Claims 25-27, 29-30, 32-34, 36 and 37 ultimately depend from claims 24 and 31 and hence were amended to recite "[t]he memory of claim xx", where xx is 24 or 31 as

appropriate. Accordingly, Applicants respectfully request that the 35 U.S.C. § 112, second paragraph, rejection be withdrawn.

THE REJECTION UNDER 35 U.S.C. § 101 SHOULD BE WITHDRAWN

The Examiner has rejected claims 10-12 and 14-23 under 35 U.S.C. § 101 as being directed to non-statutory subject matter. In particular, the Examiner reasons that the claims, when taken as a whole, only generate a sequence of pulses, that a sequence of pulses is just a signal, and that a signal *per se* is not patentable subject matter when not tied to any physical structure that transmits or receives the signal. Applicants respectfully traverse the rejection.

In AT&T Corp. v. Excel Communications, Inc., 172 F.3d 1352 (Fed. Cir. 1999) the Federal Circuit stated:

> The Supreme Court has construed § 101 broadly, noting that Congress intended statutory subject matter to "include anything under the sun that is made by man." *See Diamond v. Chakrabarty*, 447 U.S. 303, 309 ... (1980) (quoting S. Rep. No. 82-1979, at 5 (1952); H.R. Rep. No. 82-1923, at 6 (1952)); *see also Diamond v. Diehr*, 450 U.S. 175, 182... (1981). Despite this seemingly limitless expanse, the Court has specifically identified three categories of unpatentable subject matter: "laws of nature, natural phenomena, and abstract ideas." *See Diehr*...

The signals formed by the methods of claims 10-12 and 14-23 are not laws of nature, natural phenomena, or abstract ideas and are thus patentable under *AT&T Corp. v. Excel Communications, Inc.*. The signals formed by the methods of claims 10-12 and 14-23 are manmade and have functional utility. Furthermore, section 2106 IV.B.1.(c) (p. 2100-14) of the February 2003 Revision of the Manual of Patent Examining Procedure (Original Eighth Edition, August 2001, hereinafter "M.P.E.P") and the authority cited therein specifically supports the patentability of claims directed to signals:

> (c) Natural Phenomena Such as Electricity and Magnetism
> Claims that recite nothing but physical characteristics of a form of energy, such as a frequency, voltage, or the strength of a magnetic field, define energy or magnetism, *per se*, and as such are nonstatutory natural phenomena. *O'Reilly v. Morse*, 56 U.S. (15 How.) 62, 112-14 (1853). **However, a signal claim directed to a practical application of electromagnetic energy is statutory regardless of its transitory nature.** See *O'Reilly*, 56 U.S. at 114-19; *In re Breslow*, 616 F.2d 516, 519-21, 205 USPQ 221, 225-26 (CCPA 1980).

Section 2106 IV.B.1.(c) of the M.P.E.P. (*emphasis added*)

Claims 10-12 and 14-23 are directed to a method of forming signals. The signals have practical application as Large-Area Code-Devision-Multiple-Access codes and, as such, are patentable under *AT&T Corp. v. Excel Communications, Inc.* as well as Section 2106 IV.B.1.(c) of the M.P.E.P. and the authority cited therein.

THE REJECTION UNDER 35 U.S.C. § 102 SHOULD BE WITHDRAWN

The Examiner has rejected claims 10, 12, 14, 16, 24, 26, 29, 31, 33, and 36 under 35 U.S.C. § 102(e) as allegedly being anticipated by United States Patent 6,493,378 B1 to Zhodzishsky. This rejection is respectfully traversed. The Examiner claims that Zhodzishsky discloses a plurality of pulse-trains each comprising a plurality of pulses separated by intervals where each one of the of the plurality of intervals is unequal in duration. In particular, the Examiner refers to element 402 of Fig. 4 and column 23, line 4 of Zhodzishsky.[1]

Contrary to the Examiner's assertions, element 402 of Fig. 4 and column 23, line 4 *et seq.* of Zhodzishsky do not teach unequal intervals. Column 22, lines 61-65, of Zhodzishsky states that graph 402 represents the asymmetric strobe signal $S(t)=S_{P2}(t)$, where $S_{P2}(t)$ comprises a repeating sequence of strobes equally spaced in time by the chip duration Δ. Furthermore, each strobe in graph 402 has the same total duration D, where D is less than the chip duration Δ.

Admittedly, the strobes in graph 402 can be asymmetric (*i.e.*, contain a first portion with a first polarity and duration D_1, and contain a second portion with a second polarity and duration D_2, where $D_1 + D_2 = D$ and D_1 and D_2 are different). However, the respective time intervals D_1 and D_2 are the same for *each strobe in graph 402.* See, Zhodzishsky, column 22, line 66, through Zhodzishsky column 23, line 4, where it is stated that *each strobe comprises a first pulse* P_1 of a first value S_1 and a first duration D_1 and a second pulse P_2 of a second value S_2 and second duration D_2. Column 23, line 4, states that durations D_1 and D_2 can be the same or different. But this does not mean that a given strobe in graph 402 can have a D_1

[1] While the September 29, 2003 office action cites Zhodzishsky column 24, line 4, Applicants assume that this citation is a typographical error and that the Examiner meant to cite Zhodzishsky column 23, line 4, where it is stated that durations D_1 and D_2 may be the same or different.

and D_2 that differs from the D_1 and D_2 of another strobe in graph 402. Inspection of graph 402 clearly shows that the duration D_1 of each strobe in graph 402 is the same and that, likewise, the duration D_2 of each strobe in graph 402 is the same. Therefore the interval between each strobe in graph 402 exactly the same, Δ - D.

Zhodzishsky's graph 402 could be considered in a different light, where the first and second pulse, respectively denoted P_1 and P_2, of each strobe in graph 402 are each equated to different pulses in the pulse-trains indicated in Applicants' claims. Viewed in this light, there is a zero length time interval between pulses P_1 and P_2 in a given strobe in graph 402 of Zhodzishsky and a time interval of Δ - D between the pulse P_2 of a leading strobe and the pulse P_1 of the strobe immediately trailing such a leading strobe. However, even if graph 402 is viewed in this light, it still does not anticipate Applicant's claims as amended. Claim 10 as amended indicates that each one of the intervals of a pulse-train is unequal in duration to *each other* interval of the pulse train. Claims 24 and 31 already indicate the limitation that each interval in a pulse train is unequal. In Zhodzishsky, there are at most two intervals (a zero length time interval and a time interval of Δ - D). Thus, Zhodzishsky does not teach a pulse train in which each time interval between pulses in the pulse train is different as indicated in claims 10, 24 and 31. The remaining claims rejected under 35 U.S.C. § 102(e) ultimately depend from claims 10, 24, or 31 and are therefore patentable over Zhodzishsky for at least the same reasons. In addition, certain of the rejected dependent claims are patentable over Zhodzishsky for additional reasons presented below.

Claims 12, 26, and 33. Claims 12, 26, and 33 indicate that the duration of any one interval is unequal to a sum of durations of any other two intervals. The Examiner claims that Zhodzishsky teaches this limitation. The Examiner supports this contention by pointing out that the duration of D_1 of pulse P_1 is unequal to the sum of durations of any other two intervals. This reasoning is erroneous. The intervals indicated in the rejected claims are *between pulses*. Duration D_1 of pulse P_1 is not an interval between pulses. Applicants have amended claim 10 to ensure that the intervals indicated by Applicants claims are at all times understood to represent time periods *between* pulses rather than pulse durations.

Claim 16. The Examiner has rejected claim 16 on the basis that the cross correlation function between any two code words is inherently zero. Claim 16 does not claim such a feature. Claim 16 recites that the *side lobes* in the cross correlation function between any two of the code words has values that are equal to one of zero, plus-amplitude squared and minus amplitude squared. Cross-correlation functions with side lobes adopting such values are illustrated in Applicants' Figs. 4 and 5. Therefore, the Examiner has not established a prima

facie case that the cross-correlation function of any signal represented in Zhodzishsky will have the properties indicated in claim 16 and illustrated in Applicants' Figs. 4 and 5.

Claims 29 and 36. The Examiner has rejected claims 29 and 36 based on the teachings of graph 402 of Fig. 4 of Zhodzishsky. However, claims 29 and 36 are directed to compression codes. Nowhere in Fig. 4 or any text associated with Fig. 4 of Zhodzishsky is reference made to a compression code.

For the above-identified reasons, Applicants respectfully request that the 35 U.S.C. § 102(e) rejection be withdrawn.

THE REJECTION UNDER 35 U.S.C. § 103 SHOULD BE WITHDRAWN

The Examiner has rejected claims 18, 19, 21, 30, and 37 under 35 U.S.C. § 103(a) as being unpatentable over Zhodzishsky. Applicants respectfully traverse the rejection. Claims 18, 19, 21, 30, and 37 depend from claims 10, 24, or 31. As discussed in the section directed to the 35 U.S.C. § 102(e) rejection above, Zhodzishsky fails to disclose a pulse train in which the time interval between each pulse in a pulse train is different. Nor does Zhodzishsky suggest such a feature. Thus, Zhodzishsky does not render claims 10, 24, or 31 obvious and therefore does not render dependent claims 18, 19, 21, 30, and 37 obvious. For these reasons, Applicants request that the 35 U.S.C. § 103(a) be withdrawn.

THE OBJECTION TO CLAIMS 25, 27, 32 AND 34 SHOULD BE WITHDRAWN

For the reasons discussed above, each of the claims from which 25, 27, 32 and 34 depend are believed to be fully allowable. Accordingly, Applicants request that the objection to claims 25, 27, 32, and 34 be withdrawn.

CONCLUSION

Applicants respectfully request entry of the foregoing amendments and remarks into the file of the above-identified application. Applicants believe that each ground for rejection has been successfully overcome or obviated, and that all the pending claims are in condition for allowance. Withdrawal of the Examiner's rejections and allowance of the application are respectfully requested.

Respectfully submitted,

Date: December 22, 2003

Brett Lovejoy 42,813
Brett Lovejoy (Reg. No.)

for: Thomas D. Kohler (Reg. No. 32,797)
PENNIE & EDMONDS LLP
3300 Hillview Avenue
Palo Alto, CA 94304
650-493-4935